

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT
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KUSKOKWIM AREA

STAFF

BETHEL OFFICE: PO BOX 90, Bethel, Alaska 99559

Dee Dee A.S. Jonrowe
Kuskokwim Area Biologist

Rae Baxter
Kuskokwim Project Biologist

Keith Schultz
Assistant Area Mgmt. Biologist

ANCHORAGE OFFICE: 333 Raspberry Road, Anchorage, Alaska 99502

Dan Schneiderhan
Kuskokwim Project Biologist

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TABLE OF CONTENTS

	Page
INDEX TO FIGURES AND TABLES	iii
PREFACE	1
INTRODUCTION	2
Area and District Boundaries	2
Fishery Resources	2
Commercial Fishery	3
Subsistence Fishery	3
Management Program	4
SALMON	6
Area Summary - Commercial Fishery	6
Fishing Effort	6
Catches	6
Buyers and Processors	6
Economic Value	7
Enforcement	7
Emergency Orders	7
Special Studies	7
Kuskokwim River (Districts 1 and 2)	7
Commercial Fishery	7
King Salmon	9
Chum and Red Salmon	10
Coho Salmon	12
Subsistence Fishing	12
Escapement	14
Quinhagak (District 4)	14
Commercial Fishery	14
Subsistence Fishery	15
Escapement	15
Goodnews Bay (District 5)	16
Commercial Fishery	16
Subsistence Fishery	16
Escapement	16
Outlook for 1982	17
King Salmon	17
Chum Salmon	17
Coho Salmon	17
Pink Salmon	18

INDEX TO FIGURES AND TABLES

	<u>Page</u>
Figure 1. Kuskokwim area map	19
Table 1. Kuskokwim area salmon fishery emergency orders, 1981 .	20
Table 2. Kuskokwim area salmon project summaries, 1981	23
Table 3. Kuskokwim area salmon processors and associated data .	27
Table 4. Kuskokwim area salmon entry permits issued by village, 1981	28
Table 5. Kuskokwim area commercial and subsistence salmon catches by species and statistical area	29
Table 6. Average weight and average price per pound of salmon taken in the Kuskokwim area commercial fishery, 1981	30
Table 7. Commercial salmon catch data, lower Kuskokwim River (district 1, 335-10) all gear combined, 1981	31
Table 8. Commercial salmon catch data, middle Kuskokwim River (district 2, 335-20), all gear combined, 1981	32
Table 9. Age and sex composition of Kuskokwim area king salmon sampled at various locations, 1981	33
Table 10. Kuskokwim area subsistence fishery summary, 1981	34
Table 11. Commercial salmon catch data, Quinhagak (district 4, 335-40), all gear combined, 1981	35
Table 12. Commercial salmon catch data, Goodnews Bay (district 5, 335-50), all gear combined, 1981	36
Table 13. Aerial salmon escapement surveys in the Kuskokwim Area, 1981	37
Table 14. Kuskokwim area herring fishery emergency orders, 1981 .	73
Table 14a. Kuskokwim area herring processors and associated data, 1981	75
Table 15. Commercial herring catch data, Security Cove District, 1981	76

	<u>Page</u>
A. T. 11. Commercial king salmon catches by fishing period during the king salmon season, Kuskokwim River (district 1, 335-10), 1974-1981	52
A. T. 12. Associated environmental and catch data, Kuskokwim River, 1965-1981	53
A. T. 13. Utilization of Kuskokwim River chum salmon, 1960-1981	54
A. T. 14. Commercial chum salmon catches by fishing period during the chum salmon season, Kuskokwim River (district 1, 335-10), 1971-1981	55
A. T. 15. Commercial coho salmon catches by week, lower Kuskokwim River (district 1, 335-10), 1974-1981	57
A. T. 16. Kuskokwim River subsistence king salmon catches by village, 1960-1981	59
A. T. 17. Kuskokwim River subsistence "other salmon" catches by village, 1960-1981	61
A. T. 18. Subsistence fishery historical summary, Kuskokwim River 1981	63
A. T. 19. Quinhagak subsistence fishery historical summary, 1967-1981	64
A. T. 20. King salmon escapement counts, Kuskokwim River drainage, 1970-1981	65
A. T. 21. Summary of important regulation changes affecting the commercial herring fishery in the Security Cove and Goodnews Bay district, 1977-1981	80
A. T. 22. Estimated biomass and commercial harvest data for Security Cove and Goodnews Bay districts, 1978-1981	83
A. T. 23. Numbers of buyers and fishermen participating in commercial herring fisheries in Security Cove and Goodnews Bay districts, 1978-1981	84
A. T. 24. Subsistence herring catch and effort data for selected villages, eastern Bering Sea, Alaska, 1975-1981	85
A. T. 25. Commercial whitefish catch data, Kuskokwim River, 1977-1981	88

PREFACE AND INTRODUCTION

PREFACE

This report presents all available information concerning the management of commercial and subsistence salmon, herring and miscellaneous fisheries in the Kuskokwim area. Although data from many special research projects are included in this report, complete documentation of these projects and results will be presented in separate reports.

Data presented in this report supercedes information found in previous management reports. An attempt has been made to correct errors in previous reports, and previously unrecorded data have been incorporated into this report which are indicated by appropriate footnotes.

This report is organized into the following major sections:

A. Salmon Fishery

1. Area Introduction. This is a general and brief description of the area, its inhabitants, fishery resources, fisheries and management practices.
2. Area Summary. This section summarizes current year data for the area and makes comparisons with previous years.
3. District Reports. There are several unique and separate fisheries in the area, and separate comprehensive reports are presented for each.

B. Herring Fishery

1. Area Introduction and Fishery History. This is a general description of the area where herring occur in the Kuskokwim Region. Included is a brief history of the commercial and subsistence herring fishery from Cape Newenham north to the Naskonat Peninsula.
2. District Summaries. This section summarizes current year commercial fishery data, district stock status, enforcement activities, and management strategies for the 1982 season.

C. Whitefish Fishery

1. History. This is a general and brief description of the historic subsistence and commercial Kuskokwim River whitefish fishery.
2. River Summary. This section summarizes current year data for the Kuskokwim River.

In order to facilitate use of this report, the tabular data has been separated

species of whitefish and cisco (*Coregonus* sp.), Alaska blackfish (*Dallia pectoralis*), northern pike (*Esox lucius*) and burbot or "lush" (*Lota lota*). Additional species are listed in Appendix Table 2.

Commercial Fishery

Although the Kuskokwim area commercial salmon fishery is the oldest in the AYK region with catches reported as early as 1913, commercial fishing did not mature for a half century. For many years, small commercial mild-cure operations were conducted in or near Kuskokwim Bay while the Kuskokwim River fishery remained virtually undeveloped. During the 1930's when dog teams were intensely utilized for freight hauling, a "quasi-commercial" fishery operated in the McGrath area for the sale of dried, subsistence caught salmon for dog food. However, this fishery declined with the dog teams and the Kuskokwim area experienced little additional commercial effort until Alaska became a state more than twenty years later (Appendix Table 3).

Commercial salmon and herring fishing activities have grown significantly since statehood as area fishermen have been making the difficult transition from a subsistence culture to a cash economy. This has affected fishing effort and has resulted in a tremendous expansion in fishermen numbers and in increased, sustained effort. Fishing vessels have remained virtually unchanged over the years, but increased utilization of highly mobile nylon drift nets has greatly improved the efficiency of the fleet. The overall expansion of the commercial fishery could not have been accomplished without improvements in processing and tendering facilities that have occurred throughout the area.

King, red, coho, pink and chum salmon are of primary commercial significance in the Kuskokwim area. The vast majority of the salmon catch is transported from the area as a fresh or frozen product. Coastal residents commercially utilize Pacific herring in a spring sac roe and bait fishery. Sheefish and whitefish are harvested incidentally to the salmon catch, and a limited fall and winter whitefish fishery is conducted to satisfy local market requirements.

Subsistence Fishery

Area residents have long depended upon the fishery resources as a source of food. Until relatively recently, traditional fishing methods and materials limited the size and scope of the fishery. Spears, dip nets, fish traps, and willow or caribou strip gill nets were slowly supplanted by more efficient linen gill nets. This enabled the fishery to expand tremendously. Herring, whitefish, cisco, blackfish, pike, burbot and sheefish have been historically utilized along with salmon. The majority of the salmon catch is represented by chum salmon. Since statehood, improvements in fishing gear, notably the introduction of nylon gill net webbing, have probably increased the harvest and importance of king salmon. Estimated peak subsistence salmon harvest levels were reached during the 1930's coincidental with peak activity of the quasi-commercial McGrath fishery, but records indicate a continuing decline of this fishery into the 1940's. Little catch data is available for the twenty year period prior to statehood (Appendix Table 3).

Today the value of the subsistence fishery to local people remains as

return.

If there is no apparent change in run size, it is the Department's policy to increase commercial utilization once trends in declining subsistence utilization can be established. It should be pointed out that increases in commercial fishing effort and efficiency have occurred and may balance any immediate decline in subsistence utilization with the result that present regulations will be maintained or even made more restrictive.

A unique problem in the area is the so called language barrier. Many of the older native people cannot read or speak English. Therefore, the staff must use translators when conducting the many public meetings that are annually conducted throughout the area. While it may normally take only half an hour or so to conduct a public meeting or hearing in English, it usually takes two to three times that long when Eskimo translators are used. In addition, many special regulation notices are broadcast over local radio stations in both English and Yupik. To assist in the information and education program, a weekly fishery program is broadcast over radio KYUK in Bethel during the summer months. Additionally, the Department contributes to a weekly newspaper, The Tundra Drums.

and

increment

SALMON

SALMON

AREA SUMMARY — COMMERCIAL FISHERY

Fishing Effort

In recent years, fishermen participation levels have risen in general. The lower Kuskokwim River (district 1) and the Quinhagak area (district 4) have become the centers for most Kuskokwim district fishermen. This is due to the close proximity to population centers and the liberal harvest goals associated with these fisheries. The district 2 (middle Kuskokwim River) and district 5 (Goodnews Bay area) fisheries have remained fairly stable in terms of the number of fishermen working in these areas. This is due to the relative remoteness and smaller harvest levels associated with these fisheries. Appendix Table 4 shows the effort levels in each district over the past twelve years.

The trend upwards in fishing effort may appear to be somewhat of a contradiction considering that Limited Entry was initiated in 1976 for the Kuskokwim Area. At that time a finite number of permits were issued to fishermen based on points earned by past participation in the fishery. Some families were eligible for more than one permit, likewise many elderly fishermen were eligible. Many of these fishermen, after having received a permit, did not immediately participate in the fishery. These inactive permits have since been transferred and/or sold to more aggressive fishermen. In 1981, 807 Kuskokwim area permits were renewed with 769 fishermen fishing at least once during the season.

Ninety-nine percent of all Kuskokwim entry permit holders were residents of the area (Table 4). These fishermen move freely between districts so registration data does not correspond with the total number of fishermen who fished each district. The total number of fishermen making deliveries at least once in each district was: 335-10, 679; 335-20, 153; 335-40, 186; and 335-50, 48 (Appendix Table 4).

Catches

The 1981 commercial salmon catch of approximately 950,000 fish was the second largest catch ever recorded, second only to the 1980 harvest and was 27% above the previous five-year average of 693,093 fish (Appendix Table 3). Species composition was 79,377 kings, 105,940 reds, 278,587 cohos, 463 pinks, and 485,635 chum salmon (Table 5).

The king and red salmon catches were at record levels. The chum salmon catch was again exceptionally strong but did not quite reach the record set in 1980. The pink salmon catch was low, typical for odd year runs.

Commercial catches of all species throughout the season were strongly influenced by intense, consistently high fishing effort, increased fleet efficiency, and a good run of salmon.

Average 1981 salmon weights are presented in Table 6.

Buyers and Processors

Table 3 includes all buyers and processors that operated during 1981 in the

Lower Kuskokwim River commercial fishermen operate highly mobile drift gill nets. This type of fishing involves laying out 35 to 50 fathoms of gill net from a skiff and then drifting with the river current. Drift net fishing requires a section of river that is relatively free of snags. Set gill nets are not utilized to a great extent by commercial fishermen and are used mainly for subsistence fishing. Commercial set gill nets are fished in small eddies along the bank of the Kuskokwim River and larger eddies out in the main river. Set gillnetting is done with much shorter nets, usually 5 to 15 fathoms in length, which tend to be more poorly constructed than do the drift gill nets.

Although there are no mesh size restrictions on nets operated in the lower district through June 25, most nets used during this time consist of 8-1/2 inch stretched mesh webbing. After June 25, a six inch stretched mesh size limitation is in effect and most nets consist of 5-1/4 - 5-1/2 inch stretched mesh. Depths of nets are restricted to a maximum of 35 meshes for nets over six inches in stretched mesh and a maximum of 45 meshes for nets six inches or smaller in stretched mesh measure.

Kuskokwim River skiffs are long and narrow with a high bow. Generally, boats vary from 16 to 32 feet (23 foot average) in length and 2-1/2 - 3 feet in deck width. Boats are generally poor for fishing as they are unstable, too narrow for a stern roller, and the sides and stern are too low to carry much of a load. In recent years, however, more sophisticated vessels are entering the fishery including jet boats and larger diesel vessels that are used to fish herring on the coast.

Several important regulations affecting commercial fishing efforts on the Kuskokwim River are:

- 1) Until June 26, commercial fishing periods are regulated by emergency order. This allows scheduling of the king salmon harvest throughout a greater portion of the run. This is necessary because of the intensive nature of the king salmon fishery.
- 2) Commercial fishing periods are limited to two 6-hour periods each week during the chum salmon season. This helps offset the increased effort and efficiency of the fleet and distributes the allowable harvests over a greater portion of the salmon run.
- 3) Commercial fishing is allowed only below Bethel (the lower 86 miles of river) during the "chum salmon season" (June 26 - July 31). Only gill nets of six-inch stretch mesh or less can be used during this time. Restricting fishing to the lower portion of the district enhances fish quality, helps prevent excessive harvest and wastage, and allows subsistence demands to be met. The gill net mesh restriction minimizes the capture of king salmon, particularly the larger, more fecund females.
- 4) Subsistence fishing is prohibited for 24 hours before, during, and for 6 hours after each commercial fishing period in district 1 prior to June 25 and from August 1 to August 31. During the "chum salmon season" (June 26-July 31), only the lower district below Bethel is closed to subsistence fishing in conjunction with commercial

The commercial king salmon season started June 10 and consisted of two six-hour fishing periods. Fishing time continues to be restricted in recent years due to increased fishing effort, gear efficiency, and competition among fishermen. This aggressive fishing effort by the fleet is primarily responsible for the short season.

The Kuskokwim River king salmon run can be characterized as above average in magnitude for 1981.

The 1981 commercial catch in district 1 was 29,882 kings taken during the king season. These together with the incidental catch made during the later chum and coho salmon seasons brings the total harvest to 42,392 fish, a 27% increase over the previous five year average. Commercial effort during the king salmon season in district 1 totaled 589 fishermen. Fishermen hours increased from the 1980 level to 6,180 and the number of equivalent days fished was 0.5 (Appendix Table 11). The catch per vessel hour figure of 4.8 is the same as the 1980 figure.

Four processors operated during the season and paid an average \$.87 per pound for kings. King salmon weighed an average of 22 pounds in the district 1 commercial catch for 1981.

The district 2 commercial fishery was opened for a total of 12 hours during June 16 and 19 when 4,771 kings were taken. One hundred and fifty-three fishermen made commercial landings during the 1981 king salmon season, establishing a new record three times greater than the previous five year average (Table 8). This occurred when fishermen from the lower river traveled to this district on June 19 as district 1 was closed at that time. King salmon brought an average \$.84 per pound with six processors operating during the season.

The total king salmon commercial catch for the Kuskokwim River totaled 47,663 fish, 22% higher than the previous five year average (Appendix Table 10).

Chum and Red Salmon

Prior to 1971, chum salmon catches represented only fish taken incidentally to the king and coho salmon fisheries. A commercial chum fishery was initiated in 1971 due to several factors:

- 1) Early subsistence catch estimates for the period 1924-1943 indicate an average annual catch of 448,000 chum salmon, compared to an average 221,000 chum salmon taken yearly during the 1960-1970 period. This represents a reduction of 227,000 fish per year. This subsistence harvest reduction is believed to have been largely influenced by lessening dependence on subsistence fishing.
- 2) There are a minimum of 16 known chum salmon spawning tributaries in the Kuskokwim River system. Most of these streams cannot be surveyed annually due to fund limitations and adverse stream or weather conditions. Usually, not more than three tributary streams can be adequately surveyed in any given season, but as many as 185,000 spawning chums have been counted. This indicated a significant chum salmon population.

commercial king, chum and coho seasons.

Coho Salmon

The commercial coho salmon season in district 1 opened on August 3. Fishermen were allowed two 6 hour fishing periods per week totaling 54 hours for the season. Consistently heavy effort dictated these series of shorter periods rather than the long fishing periods of the past. Total effort for the season was 586 boats which reflected a decrease over the 1979 record.

The total coho season catch this year was 207,868 fish. The coho run got off to somewhat of a slow start but quickly picked up and remained fairly consistent throughout the month. Peak effort and catches were experienced on August 13. The 1981 harvest followed closely the catches recorded during the last three years and was 7% higher than the previous five year average. Cohos brought an average \$.62 per pound in district 1 (Table 7).

In district 2 the coho season consisted of two six hour periods on August 17 and 20 with a total of 3,383 cohos landed by 16 fishermen. Cohos brought an average \$.55 per pound (Table 8).

Subsistence Fishery

Questioned by C. B. 10/2/81
The annual survey of the Kuskokwim River subsistence fishery was initiated in 1960. During the early years, the Department utilized "smokehouse counts" to determine total utilization of subsistence caught fish. In an effort to determine additional timing and magnitude data, the Department began using "subsistence catch calendars" which are distributed to fishermen prior to the fishing season. Subsistence fishermen enter their daily catches of salmon and non-salmon species on the calendar. During July and August a Department crew utilizes a cabin skiff to travel more than 360 river miles (Eek to Swift River) to collect catch data from the individual fishermen in addition to recording certain information from non-fishing families. After the river survey is completed, catch questionnaires are sent to those fishermen not individually contacted. In 1981 interviews were conducted by Division of Commercial Fisheries personnel.

In the 1969 Annual Report, a review is presented regarding methods used to obtain subsistence harvest and related information. All subsistence information is presented in tabular form in this report, except Appendix Table 17 which represents "expanded data". This includes those families known to have fished but who, for one reason or another, were not personally contacted by the survey crew. Catch data for these families are assumed to be the same as the averages for the particular village and are included in most of the tables.

Reported coho salmon catches are very minimal because the coho salmon run occurs after the survey is completed. Most of the coho salmon catch data is obtained from the return of catch calendars. Prior to 1969, little effort was made to determine the coho salmon harvest. The coho salmon estimates are not included in the comparative catch tables.

The Kuskokwim River harvest included 59,669 king salmon, 153,766 chum salmon, and 20,950 coho utilized by 579 fishing families during 1981 (Table 5).

600

After several seasons of research it is felt that the harvests in these communities reflects the fishing effort, river conditions, harvest methods (i.e. fishwheels, weirs, gillnets, and rod and reel) and abundance of salmon by species. It appears throughout the Kuskokwim system that the king, red, and chum salmon populations have been on the increase in recent years. Seasonal employment opportunities that occur concurrent to the salmon runs greatly affect the fishing success in these areas. This situation was amplified during the summer of 1981 when exceptional seasonal employment opportunities resulted in a corresponding decrease in usage of the subsistence salmon fishery in Nikolai. In this village 76% of the total subsistence king salmon harvest was taken by the use of rod and reel, 19% by set net, and the remaining 5% by fishwheel. This data appears to reflect an unusually high proportion of the harvest taken by rod and reel. Past information on harvest methods is spotty but this is an area of interest which greatly affects the fishing success these villages experience each year.

It should be noted that these villages are located near the upper reaches of the Kuskokwim salmon spawning habitat. Large populations similar to those found in middle Kuskokwim systems do not seem to occur in these areas.

Escapement

Kuskokwim River drainage escapement estimates from aerial surveys have proven difficult and costly to obtain. Varying stream and weather conditions, in addition to pilot and observer skills, often make the data difficult to interpret (Appendix Table 20). Although aerial surveys will be continued for some streams, emphasis will be placed on obtaining accurate escapement figures by use of counting towers or weirs on several "key" spawning tributaries.

All the Kuskokwim River aerial survey results for 1981 are presented in Table 13. Escapements of kings, chums and reds were above average as documented by limited aerial surveys. It should be noted that survey efforts were hampered in 1981 by high and turbid stream conditions. Surveys were not possible for several of the major salmon spawning streams. The Kogruklu tower operation was discontinued in 1979. An established percentage of the Holitna weir counts are used to obtain the information formerly supplied by the tower operation. Record high counts of king, red and chum salmon were recorded during this season. The Holitna weir operated during the coho salmon run for the first time in 1981. Although the weir operated longer in 1981, comparative counts also exceeded all previous years.

QUINHAGAK (DISTRICT 4)

Commercial Fishery

The Quinhagak fishery is one of two located in Kuskokwim Bay (Figure 1). This fishery has traditionally been very sporadic due to unreliable processing facilities; however, the commercial fishery has stabilized during the past few seasons.

Fishing regulations for this district are very similar to those found on the Kuskokwim River, except that there are no distinct fishing seasons. Beginning with the 1971 season, the basic fishing period was reduced from two 24-hour

Because the survey was too early no coho salmon were seen. Weather and stream conditions prevented further aerial surveillance in 1981.

During the 1981 season a side-scanning salmon counter was employed in the Kanektok River to determine the feasibility of counting salmon by sonar. The sonar was operational from August 14 through 28 with a total of 6,026 salmon counted. Additional studies are planned to determine the feasibility of using sonar to determine species abundance and timing in this river.

GOODNEWS BAY (DISTRICT 5)

Commercial Fishery

Traditionally, the male residents from the villages of Goodnews Bay and Platinum have gone to Bristol Bay each summer to fish or work in the canneries, leaving the women and children home to fish for subsistence purposes. Prior to 1968, there are no records indicating that commercial salmon harvests were ever made in Goodnews Bay. The Department held public meetings in the area during the early 1960's regarding the possibility of initiation of a commercial fishery, but the negative response from village residents plus the absence of salmon buyers precluded this development.

In late August of 1968, the commercial salmon fishing was opened by emergency order in Goodnews Bay. This commercial fishery was created as a result of a request from area residents. Department surveys indicated that a small harvestable supply of salmon was available. The fishery has been sporadic in nature due to inconsistent processing capabilities and inclement weather.

The commercial salmon season was opened June 16. The harvest was composed of 7,190 kings, 40,273 reds, 19,749 cohos, 11 pinks, and 13,642 chums, totaling 80,865 fish. Catches of king and red were at record levels (Table 12).

A total of 48 fishermen made commercial landings in 1981, the same number of fishermen which operated during 1980.

Division of Fish and Wildlife Protection officers initiated periodic patrols to control the illegal fishing in the lower Goodnews River during the 1981 season. Several cases were made later in the season resulting in some compliance with the regulations. A problem is still present however during the month of August.

Subsistence Fishery

Accurate subsistence data has been lacking in the district 5 fishery in recent years. During the 1981 survey a total of 13 fishing families reported harvesting 1,309 king, 3,778 small salmon, and 1,622 coho salmon.

Escapement

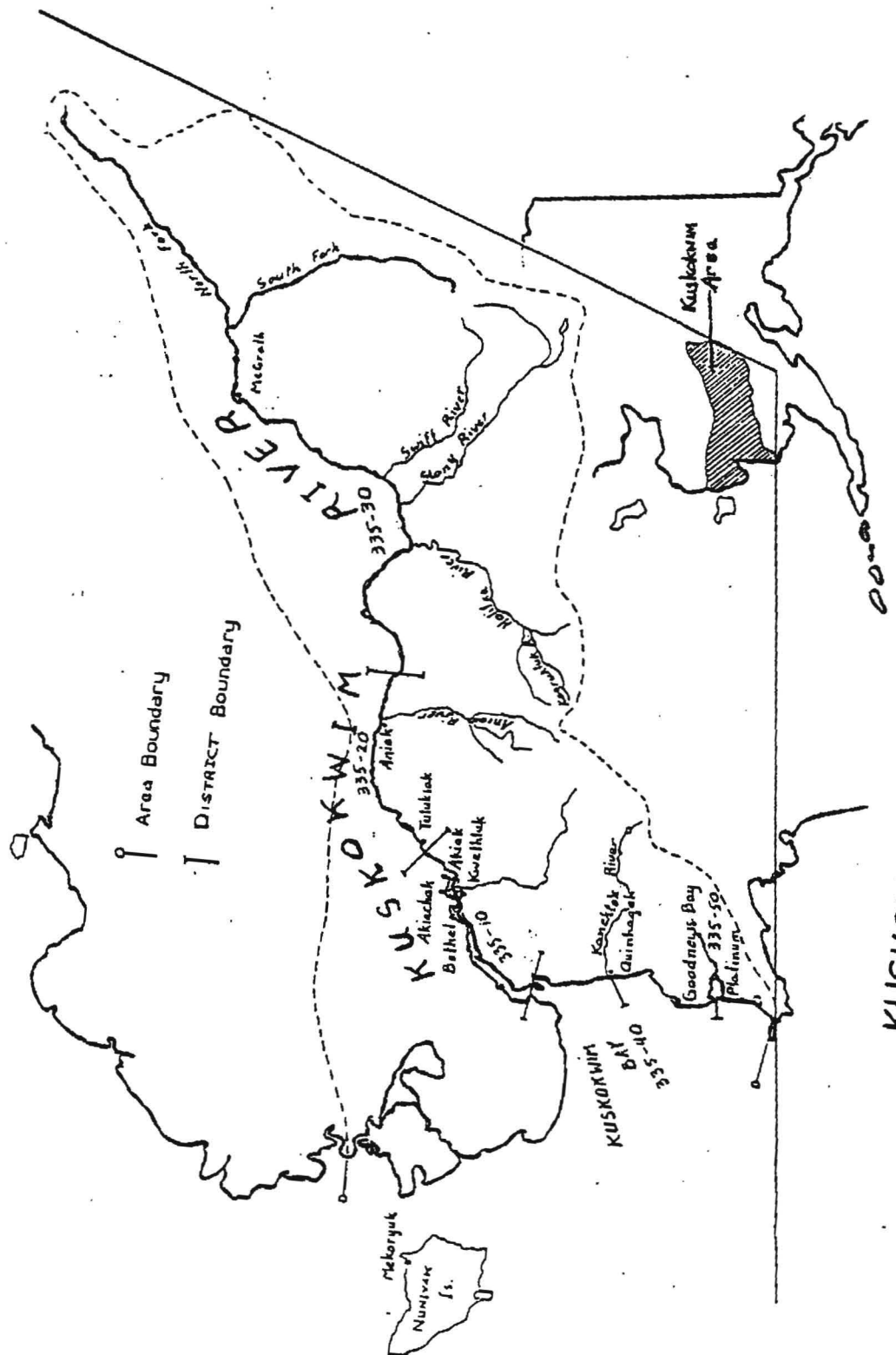
Aerial surveys revealed above average escapement for kings. Additional fishing time was permitted during July for reds when escapement counts made from the Department's tower site revealed large numbers of reds in the Goodnews River. This first year counting tower project operated from June 13 through August 15 with the expanded cumulative totals of 3,688 kings, 49,108

efforts in these years. In 1977 and 1978, the parent years for the 1982 return, the catch per unit effort was average. Due to the changed nature of the fishery since the mid-seventies and the lack of escapement data on this species, a conservative management approach will be taken in 1982.

The comparative catch data indicates that the 1982 return should be average or above average in magnitude.

Pink Salmon

Pink salmon returns during odd years (1977, 1979, 1981, etc.) are normally poor.



KUSKOKWIM AREA
FIGURE 1

Table 1. Kuskokwim Area Salmon Fishery Emergency Orders, 1981.

<u>E.O. No.</u>	<u>Date</u>	<u>Action Taken</u>	<u>Justification</u>
13	10 June	Opened District 1 to commercial salmon fishing and established first commercial salmon fishing period from 6 PM until 12 midnight June 10, 1981.	Subsistence catches and test net catches indicated that king salmon were present in sufficient numbers.
14	15 June	Opened District 4 (Quinhagak) and District 5 (Goodnews Bay) to commercial salmon fishing effective June 15, and established twice weekly periods from 6 PM Monday until 6 AM Tuesday and from 6 PM Thursday until 6 AM Friday.	King salmon present in sufficient numbers.
15	16 June	Established second commercial king salmon fishing period in District 1 from 6 PM until 12 midnight June 16, and opened District 2 to commercial salmon fishing from 6 PM until 12 midnight June 16.	King salmon present in sufficient numbers.
16	19 June	Established second commercial king salmon fishing period in District 2 from 6 PM until midnight June 19.	King salmon present in sufficient numbers.
17	22 June	Established early chum period in District 1 from 6 PM until 12 midnight June 22, 1981 and established twice weekly periods from 6 PM until 12 midnight Monday and 6 PM until 12 midnight Thursday. Mandated use of 6-inch or smaller mesh gear in District 1 and reduced the size of the commercial fishery in District 1 to that area from Bethel to the north and of Eek Island.	Early chum run in sufficient numbers; need to direct effort away from king salmon in order to meet subsistence and spawning requirements.

Table 1. Kuskokwim Area Salmon Fishery Emergency Orders, 1981 (continued).

<u>E.O. No.</u>	<u>Date</u>	<u>Action Taken</u>	<u>Justification</u>
18		VOIDED	
19	25 June	Opened District 2 to commercial chum salmon fishing from 6 PM until 12 midnight June 25, 1981.	Chum salmon present in sufficient numbers.
20	6 July	Established 3 weekly fishing periods in District 5, from 6 PM Monday until 6 AM Tuesday and from 6 PM Wednesday until 6 AM Thursday and from 6 PM Friday until 6 AM Saturday.	Tower counts indicate good escapement; chum and red salmon present in sufficient numbers.
21	13 July	Established 3 weekly fishing periods in District 4, from 6 PM Monday until 6 AM Tuesday and from 6 PM Wednesday until 6 AM Thursday and from 6 PM Friday until 6 AM Saturday.	King salmon landings continue to decline while chum and red salmon landings increase.
22	15 July	Established 3 24-hour commercial fishing periods per week in District 5, from 6 PM Monday until 6 PM Tuesday and from 6 PM Wednesday until 6 PM Thursday and from 6 PM Friday until 6 PM Saturday.	Salmon present in sufficient numbers.
23	3 Aug.	Established 3 12-hour daytime commercial fishing periods per week in Districts 4 and 5, from 6 AM until 6 PM on Monday, Wednesday and Friday.	Allows maximum daylight fishing hours to facilitate fishermen safety.

Table 1. Kuskokwim Area Salmon Fishery Emergency Orders, 1981 (continued).

<u>E.O. No.</u>	<u>Date</u>	<u>Action Taken</u>	<u>Justification</u>
24	3 Aug.	Reopened District 1 to commercial salmon fishing and established twice weekly periods from 9 AM until 3 Monday and Thursday from August 1 through August 31.	Coho salmon present in sufficient numbers. Daylight hours facilitate fishermen safety.
25	17 Aug.	Opened District 2 to commercial salmon fishing from 9 AM until 3 PM August 17, 1981.	Coho salmon present in sufficient numbers.
26	19 Aug.	Closed District 5 to commercial fishing on August 19, 1981; reopened District 5 to commercial fishing effective August 21, 1981 on the regular schedule 6 AM until 6 PM Monday, Wednesday and Friday.	On August 17, Department personnel encountered two fishermen fishing in illegal waters (Goodnews River); 5AAC 39.185 policy on closures due to illegal fishing adopted by the Board of Fisheries in 1980 allows closures in instances of illegal fishing.
27	20 Aug.	Opened District 2 to commercial salmon fishing from 9 AM until 3 PM August 20, 1981.	Coho salmon present in sufficient numbers. Harvest guideline of 2,000 to 4,000 coho salmon has not been met.

Table 2. Kuskokwim Area Salmon Project Summaries, 1981.

1. Kuskokwim River Test Fishing.

- a. Location: Kwegoooyuk on the east bank of the mouth of the Kuskokwim River located 56 river miles downstream from Bethel.
- b. Objectives: Determine run timing and relative abundance of kings, red and chum salmon.
- c. Results: The 1981 project captured 1,218 kings, 1,793 chums and 1,345 sockeye, totaling 4,336 salmon between May 28 and July 15. The king catch was average and the chum catch substantially above average and was indicative of run magnitude which was judged excellent based on other escapement parameters. Sockeye catches were second highest made at this site and seemed consistent with the run magnitude revealed by the commercial catch and weir count.

2. Ignatti Weir.

- a. Location: Upper Holitna River, about 1.5 miles below the Kogrukluk River.
- b. Objectives: Develop a portable weir and trap to enumerate salmon escapement by species and sex and to obtain salmon for sampling without causing harm to the fish.
- c. Results: The 1981 salmon escapement for the Kogrukluk River through the Ignatti weir was stupendous in all aspects. The weir operated continuously throughout the season from 27 June to 5 October. The king salmon count of 16,075 exceeded the previous high of 13,132 counted in 1978, the red salmon count of 17,702 was 5 1/2 times greater than the next greatest, the estimated run of 3,200 in 1980, the chum salmon count of 56,495 exceeded the previous high of 47,099 in 1978 and even the 6 pink salmon was 3 times greater than that for any other year. The weir operated during the coho salmon run for the first season and 11,532 were counted. Even though the weir operated longer in 1981, comparative date counts also exceeded all previous years.

The percent of female salmon in the escapement was: King salmon 47.2%; red salmon 46.4%; coho salmon 30.5%; pink salmon 33.3%; and chum salmon 36.0%.

The king salmon run consisted of 0.3% 3 year old fish; 9.9% 4's' 16.9% 5's'; and 73.7% 6 year or older fish.

Table 2. Kuskokwim Area Salmon Project Summaries, 1981 (continued).

Much meaningful data was collected on the flora and fauna of the area, salmon fry information, adult stream life information, fecundity, climatic data and water flow rates.

3. Aniak Sonar.

- a. Location: 20 miles up the Aniak River from its confluence with the Kuskokwim River.
- b. Objectives: 1) Determine feasibility of using the side scan sonar as an inseason salmon management tool on the lower Kuskokwim River, and 2) determine salmon run timing and population characteristics.
- c. Results: The Aniak sonar project was operated from June 15 to August 6, 1981. The latest model of the Bendix side scan sonar which breaks down counts into small (-18 lbs.) and large (+19 lbs.) fish, was used. The small fish sonar count was 443,555. When daily calibration factors were used the estimated actual count was 359,514 for an estimated season overcount of 23 percent. Future changes in operating procedure should move this factor closer to zero. The total return of spawners to the Aniak system is estimated to be 544,551 of which 43,564 are kings.

The large fish sonar count was 3,520 or about one percent of the season count. This contrasts with the gillnet test fish results which indicate that 8 percent of the season's sample of 515 salmon was king salmon. However, there are several factors which may account for the apparent discrepancy and until a more in-depth analysis can be made no conclusions are possible.

The gillnet test fish program ran in conjunction with the sonar from June 17 to August 5. All salmon, except pinks, were sampled for sex, age and length. Pinks were sampled for sex and length only. The total salmon sample size was 515. Forty-three were king salmon, six were sockeye and 466 were chums. Beach seining operations were also conducted from June 30 to August 5. The total sample size was 100 salmon; one king was caught and the rest were chums. Limited seining for juveniles resulted in catches of coho and king, mainly in the 45-75 mm range.

4. Commercial Salmon Catch Sampling.

- a. Location: Bethel, Quinhagak and Goodnews Bay.
- b. Objectives: Obtain age, sex and size information for commercial caught fish.
- c. Results: Samples of all species were sampled, analyzed and presented in separate reports.

Table 2. Kuskokwim Area Salmon Project Summaries, 1981 (continued).

5. Aerial Surveys.

- a. Location: Kuskokwim River drainage (and Kuskokwim Bay).
- b. Objectives: Determine if spawning escapements for king and chum salmon are adequate.
- c. Results: Due to poor surveying weather and turbid stream conditions only four of the nearly 20 targeted streams were surveyed.

6. Fan Scan Sonar.

- a. Location: Three miles upriver from Bethel on the north bank of the Kuskokwim River.
- b. Objectives: 1) determine feasibility of using the fan scan sonar as an inseason salmon management tool on the Lower Kuskokwim River, and 2) determine salmon migration through the commercial fishery.
- c. Results: On June 30, 1981 the stability of a section of the river bed failed in the immediate vicinity of the sonar camp. This failure caused a major portion of the camp to calve-off into the river. All shore-based electrical components were rescued without damage. Pod #1 was retrieved later the same day. Pod #2 was retrieved on Due to the land slumpage and resultant camp disruption, the 1981 evaluation of the fan scan sonar covered only that period from 1 to 30 June.

7. Salmon River Weir.

- a. Location: Salmon River, a tributary of the Pitka Fork located north of McGrath.
- b. Objectives: Enumerate king salmon escapement in the upper Kuskokwim drainage.
- c. Results: The project was hindered by unanticipated high water and a lack of prior experience in the area. In spite of all problems, the weir was operational from June 10 to August 4. The first king salmon passed the weir on June 24, while the first chum salmon passed on June 28. A season's total of 877 king and eight chum salmon were released above the weir. Additionally, approximately 800 kings swam over the weir during an extensive period of high water at the peak of migration for a total estimated spawner return of 1,700 kings. Sex, age and length data was taken from 151 kings and 6 chums. Limited sampling of whitefish (Coregonus spp.) and longnose sucker (Catostomus catostomus) was conducted.

Table 2. Kuskokwim Area Salmon Project Summaries, 1981 (continued).

8. Goodnews River Tower.

- a. Location: 12 miles upriver on the south side of the middle fork of the Goodnews River near the base of Lookout Mountain.
- b. Objective: Enumerate salmon escapement by species, determine run timing and relative abundance of kings, red, pink, and chum salmon in a portion of the Goodnews River system.
- c. Results: The tower was operational by June 13 with the first fish counted on June 14. Eighteen hour a day censuses were attempted, with two twenty-four hour counts made during July. The tower operated until August 15 with the cumulative total of 2,894 kings, 18,283 chums, 42,224 reds, 1,125 pinks, and 357 cohos counted. Tower counts greatly assisted and improved in-season management of this fishery.

9. Kanektok River Side Scanning Sonar

- a. Location: Approximately eight miles upriver from the village of Quinhagak or the south bank of the Kanektok River.
- b. Objectives: Determine feasibility of using the side scan sonar as an inseason salmon management tool on the lower Kanektok River.
- c. Results: The sonar was operational from August 14 through 28 with a total of 5,657 salmon counted. Fish avoidance and debris counts were observed problems during the operation. Additional studies are planned for 1981 to determine the feasibility of using sonar to determine species abundance and timing in this river.

Table 3. Kuskokwim Area Salmon Processors and Associated Data, 1981.

Commercial Operator	Product	District
Ball Bros., Inc. General Delivery Dillingham, AK 99576	Fresh salmon King Red Chum Coho Pink	5
Chet Clark Fish Products Ltd. Box 19 Aniak, AK 99557	Fresh salmon King Coho Chum	2
J.B. Crow & Sons PO Box 567 Bethel, AK 99559	Fresh salmon King Red Coho Pink Chum	1, 2, 4
Elm Fisheries PO Box 352 Bethel, AK 99559	Fresh salmon King Red Coho Pink Chum	1, 2, 4, 5
K & A Fisheries c/o Larry Peterson Aniak, AK 99557	Fresh salmon King Red Coho Chum	1, 2
Kemp & Paulucci Seafoods 4832 West Superior St. Box 6506 Duluth, Minnesota	Frozen salmon King Red Chum Coho Pink	1, 2, 4
Pacific Pearl Seafoods Inc. 1203 114th Avenue Southeast Bellevue, WA 98004	Fresh salmon King Red Coho Chum	4
Patson Fisheries Box 445 Bethel, AK 99559	Fresh salmon King Red Chum Coho	1, 2, 4
Ted Solomon Box 1567 Havre, MT 59501	Fresh salmon King Red Chum	5
Swanson's EDSA Enterprises, Inc. PO Box 478 Bethel, AK 99559	Freshwater	1

Table 4. Kuskokwim area salmon entry permits issued by village, 1981.

Village	Number of Entry Permits
Akiachak	45
Akiak	29
Aniak	8
Atmauthluak	29
Bethel	172
Chauthbaluk	2
Chefornak	3
Eek	41
Goodnews Bay	33
Kalskag	5
Kasigluk	41
Kipnuk	14
Kongiganak	23
Kwethluk	74
Kwigillingok	15
Lower Kalskag	3
McGrath	1
Napakiak	38
Napaskiak	27
Nunapitchuk	44
Oscarville	7
Platinum	4
Quinhagak	81
Tuluksak	29
Tuntutuliak	48
Anchorage	5
St. Marys	1
Juneau	1
Manokatak	1
Trappers Creek	1
Mt. Village	0
Nome	1
Total Permits Issued	826

Age Requirement
 10-set gillnet
 16-drift gillnet

Table 5. Kuskokwim area commercial and subsistence salmon catches by species and statistical area, 1981.

Districts	King	Red	Coho	Pink	Chum 1/	Total
335-10 Lower Kuskokwim						
Commercial	42,392	48,246	207,868	292	410,542	709,340
Subsistence 2/	47,176		10,929		96,406	154,511
Total	89,568	48,246	218,797	292	506,948	863,851
335-20 Middle Kuskokwim						
Commercial	5,271	129	3,383	0	8,135	16,918
Subsistence 2/	10,831		3,843		36,522	51,196
Total	16,102	129	7,226	0	44,657	68,114
335-30 Upper Kuskokwim						
Commercial	-	-	-	-	-	-
Subsistence 2/	1,662	-	6,178	-	20,838	28,678
Total	1,662	-	6,178	-	20,838	28,678
Subtotal Kuskokwim River						
Commercial	47,663	48,375	211,251	292	418,677	726,258
Subsistence 2/	59,669		20,950		153,766	234,385
Total	107,332	48,375	232,201	292	572,443	960,643
335-40 Quinhagak River						
Commercial	24,524	17,292	47,587	160	53,316	142,879
Subsistence 2/	2,562		5,679		2,737	10,978
Total	27,086	17,292	53,266	160	56,053	153,857
335-50 Goodnews Bay						
Commercial	7,190	40,273	19,749	11	13,642	80,865
Subsistence 2/	1,409		1,622		3,178	6,209
Total	8,599	40,273	21,371	11	16,820	87,074
Total Kuskokwim Area						
Commercial	79,377	105,940	278,587	463	485,635	950,002
Subsistence 2/	63,640		28,251		159,681	251,572
Total	143,017	105,940	306,838	463	645,316	1,201,574

1/ Subsistence catches contain small numbers of red and pink salmon.

2/ Expanded data.

Table 6. Average weight and average price per pound of salmon taken in the Kuskokwim area commercial fishery, 1981. 1/

Subdistrict	Stat. Area	Average Weights by Species 2/ (Average Price/Pound)				
		King	Red	Coho	Pink	Chum
Kuskokwim River:	335-10					
	335-20	21.7 (.85) 3/	7.3 (.59)	6.3 (.58)	3.6 (.10)	7.3 (.19)
Quinhagak:	335-40	13.8 (.71)	7.1 (.64)	7.9 (.64)	3.5 (.10)	7.2 (.18)
Goodnews Bay:	335-50	12.5 (.69)	7.1 (.67)	7.9 (.67)	1.5 (.50)	7.2 (.19)

1/ Data obtained from processor weights, randomly sampled.

2/ Pounds.

3/ Data taken from king season only, 8-1/2" mesh size.

NEED Table showing above ~~data~~ data for all available years.
Quinhagak, Goodnews

Table 7. Commercial salmon catch data, lower Kuskokwim River (District 1, Area 335-10), all gear combined, 1981.

Period Code	Date of Landing	Hours Open to Fishing	Fishermen	Fishermen Hours	Catch					Catch/Fisherman Hour			
					King	Red	Coho	Pink	Chum	King	Coho	Chum	Red
1	6/10	6	489	2,934	11,897	48			2,623	4.05		0.89	0.02
2	6/16	6	541	3,246	17,985	316			11,501	5.54		3.54	0.10
	Subtotal 1/	12	589	6,180	29,882	364			14,124	4.84		2.29	0.06
3	6/22	6	511	3,066	3,830	3,852			78,168	1.25		25.5	1.26
4	6/25	6	508	3,048	2,000	6,037		2	81,431	0.66		26.7	1.98
5	6/30	6	484	2,904	2,563	12,262		3	51,942	0.88		17.9	4.22
6	7/2	6	459	2,754	1,707	9,769		6	58,594	0.62		21.3	3.55
7	7/6	6	461	2,766	1,088	5,510		41	55,799	0.39		20.2	1.99
8	7/9	6	440	2,640	941	7,760		96	66,138	0.37		25.0	2.94
	Subtotal 2/	36	613	17,178	12,129	45,190		148	392,072	0.71		22.8	2.63
9	8/3	6	430	2,580	101	1,057	16,184	21	1,866	0.04	6.27	0.7	0.41
10	8/6	6	441	2,646	77	674	13,885	25	1,046	0.03	5.25	0.39	0.25
11	8/10	6	445	2,670	54	454	26,972	31	629	0.02	10.1	0.23	0.17
12	8/13	6	473	2,838	54	233	46,252	11	448	0.02	16.55	0.16	0.08
13	8/17	6	458	2,748	38	146	34,739	19	164	0.01	12.64	0.06	0.05
14	8/20	6	380	2,280	17	55	24,184	8	73	0.01	10.6	0.03	0.02
15	8/24	6	372	2,232	16	28	23,771	7	40	0.01	10.65	0.02	0.01
16	8/27	6	346	2,076	16	25	13,785	8	59	0.01	6.64	0.03	0.01
17	8/31	6	278	1,668	8	20	8,086	14	21		4.8	0.01	0.01
	Subtotal 3/	54	586	21,738	381	2,692	207,848	144	4,346	0.02	9.6	0.2	0.12
	Grand Total	102	679	45,096	42,392	48,246	207,848	292	410,542	0.94	4.61	9.1	1.07

1/ King Season 6/10-6/16 2/ Chum Salmon 6/22-7/9 3/ Coho Season 8/3-8/31

Table 8. Commercial salmon catch data, Middle Kuskokwim River (District 2, 335-20), all gear combined, 1981.

Period Code	Date of Landing	Hours Open to Fishing	Fishermen	Fishermen Hours	Catch					Catch/Fisherman Hour			
					King	Red	Coho	Pink	Chum	King	Coho	Chum	Red
1	6/16 Period	6	18	108	933	4			810	8.64		7.5	0.04
2	6/19 Period	6	151	906	3,838	125			3,902	4.24		4.31	0.18
	Subtotal 1/	12	153	1,014	4,771	129			4,712	4.71		4.65	0.13
3	6/25 Period	6	11	66	499				3,329	7.6		50.44	
	Subtotal 2/	6	11	66	499				3,329	7.6		50.44	
4	8/17 Period	6	15	90			1,487		62		16.52	0.69	
5	8/20	6	13	78	1		1,896		32	0.01	24.3	0.41	
	Subtotal 3/	12	16	168	1		3,383		94		20.1	0.56	
	Grand Total	30	153	1,248	5,271	129	3,383	0	8,135	4.2	2.7	6.5	0.01

1/ King Season 6/16-6/19

2/ Chum Season 6/25

3/ Coho Season 8/17-8/20

Table 9. Age and sex composition of Kuskokwim area king salmon sampled at various locations, 1981.

Sex	Combined			Age 32			Age 42			Age 52			Age 62			Age 72		
	No.	Pct.	Length 1/	No.	Pct.	Length	No.	Pct.	Length	No.	Pct.	Length	No.	Pct.	Length	No.	Pct.	Length
1981 Kwegoooyuk test fish age length report 8-1/2" mesh size																		
Total	235	35.1	832.6				8	1.2	581.1	83	12.4	771.9	130	19.4	877.0	14	2.1	924.4
Male	434	64.9	841.5	1	0.2	635.0	13	1.9	593.1	93	13.9	773.6	307	45.9	868.4	20	3.0	923.8
Female	669	100.0	838.4	1	0.2	635.0	21	3.1	582.3	176	26.3	772.8	437	65.3	870.9	34	5.1	924.1
Total																		
1981 Kwegoooyuk test fish age length report 5-1/2" mesh size																		
Total	42	46.2	678.0	2	2.2	495.0	17	18.7	580.3	12	13.2	703.3	11	12.1	834.5			
Male	49	53.8	636.0	1	1.1	510.0	29	31.9	559.1	5	5.5	711.0	14	15.4	777.5			
Female	91	100.0	655.4	3	3.3	500.0	46	50.6	567.0	17	18.7	705.6	25	27.5	802.6			
Total																		
1981 Quinhagak commercial catch sample age length report 6" mesh size																		
Total	277	45.2	654.6	2	0.3	377.0	158	25.8	585.3	79	12.9	697.7	38	6.2	867.3		-	-
Male	336	54.8	681.0		-	-	194	31.7	574.2	49	8.0	715.4	86	14.0	881.5	7	1.1	937.3
Female	731	100.0	841.7	2	0.3	377.0	352	57.4	579.2	128	20.9	704.5	124	20.2	877.2	7	1.1	937.3
Total																		
1981 Ignatti weir age length report																		
Total	362	49.5	772.0	40	5.5	572.6	180	24.6	726.9	141	19.3	884.7	1	0.1	971.0			
Male	369	50.5	910.1	1	0.1	544.0	18	2.5	796.1	343	46.9	916.0	7	1.0	966.7			
Female	731	100.0	841.7	41	5.6	571.9	198	27.1	733.2	484	66.2	906.9	8	1.1	967.3			
Total																		
1981 Bethel commercial catch age length report 8-1/2" mesh size																		
Total	202	56.9	762.9	6	1.7	544.5	130	36.6	731.9	64	18.0	840.2	2	0.6	958.5			
Male	153	43.1	866.1		-	-	17	4.8	775.1	122	34.4	870.5	14	3.9	937.9			
Female	355	100.0	807.4	6	1.7	544.5	147	41.4	736.9	186	52.4	860.1	16	4.5	940.4			
Total																		
1981 Bethel commercial catch age length report 5-1/2" mesh size																		
Total	75	72.1	710.4	22	21.2	581.9	33	31.7	718.8	20	19.2	837.9		-	-			
Male	29	27.9	884.4		-	-	4	3.9	808.0	23	22.1	892.3	2	1.9	946.0			
Female	104	100.0	758.9	22	21.2	581.9	37	35.6	728.5	43	41.3	867.0	2	1.9	946.0			
Total																		

1/ All lengths: Mideye to fork of tail.

NO Goodnews!!

1-607

expanded

Table 10. Kuskokwim area subsistence fishery summary, 1981.

Village	Families	People	Dogs	King Salmon	Small 1/ Salmon	Coho Salmon	Fish Wheels
Eek	28	139	63	1,731	1,188	329	0
Tuntutuliak	15	89	67	4,466	5,873	70	0
Kasigluk	31	232	131	3,377	2,983	161	0
Nunapitchuk	27	171	106	2,918	5,465	36	0
Atmaultluak	17	98	74	1,247	2,663	0	0
Napakiak	37	202	136	3,017	6,667	432	0
Oscarville	2	13	0	495	1,260	0	0
Napaskiak	23	134	75	2,911	7,290	363	0
Bethel	151	949	156	15,367	35,093	7,705	0
Kwethluk	46	273	211	6,167	10,736	770	0
Akiachuk	28	197	157	3,094	6,292	241	0
Akiak	22	150	314	2,386	10,736	822	0
Tuluksak	23	163	114	2,446	6,500	263	0
Lower Kalskag	20	119	87	3,271	3,894	731	0
Upper Kalskag	12	65	93	1,171	5,746	1,170	0
Aniak	35	153	205	3,102	11,922	1,572	2
Chuathbaluk	11	62	52	841	8,460	107	2
Napamute	2	11	7	45	684	56	0
Crooked Creek	16	80	78	512	6,843	1,142	0
Red Devil	7	34	51	144	4,205	1,978	2
Sleetmute	20	84	75	728	7,520	2,285	0
Stony River	6	27	38	233	1,586	717	3
Nikolai	21	82	119	508	3,850	45	1
Totals- Kuskokwim R.	600	3,527	2,837	60,177	157,616	20,995	10
Platinum	4	17	4	100	333	0	0
Goodnews Bay	13	68	40	1,309	3,178	1,622	0
Quinhagak	53	289	110	2,562	2,737	5,679	0

NOT EXPANDED

64,148 163,864 23,556

1/ Small salmon includes chum, red, some small king, and pink salmon.

192,160

2/ - ?

NOT same number used on page 12 or on 34

NOT Expanded

Table 11. Commercial salmon catch data Quinbagak (District 4, Area 334-40), all gear combined 1981.

Period Code	Date of Landing	Hours Open to Fishing	Fisherman	Fisherman Hours	Catch					Catch/Fisherman Hour			
					King	Red	Coho	Pink	Chum	King	Coho	Red	Chum
1	6/15	6	83	996	2,948	89			1,008	2.96		0.09	1.01
	6/16	6											
2	Period	12											
	6/18	6	126	1,512	6,694	355			2,611	4.43		0.23	1.72
	6/19	6											
3	Period	12											
	6/22	6	76	912	4,002	379			2,177	4.39		0.42	2.39
	6/23	6											
4	Period	12											
	6/25	6	65	780	3,719	732			3,606	4.77		0.94	4.62
	6/26	6											
5	Period	12											
	6/29	6	Strike										
	6/30	6											
6	Period	12											
	7/2	6	46	552	1,853	1,242			3,500	3.36		2.25	6.34
	7/3	6											
7	Period	12											
	7/6	6	66	792	996	1,126			2,953	1.26		1.42	3.73
	7/7	6											
8	Period	12											
	7/9	6	66	792	739	1,532		1	7,408	1.01		2.10	10.16
	7/10	6											
9	Period	12											
	7/13	6	77	924	639	2,278		44	7,438	0.69		2.47	8.05
	7/14	6											
10	Period	12											
	7/15	6	102	1,224	1,236	3,099		8	10,756	1.00		2.53	8.79
	7/16	6											
11	Period	12											
	7/17	6	70	840	290	937	4	0	3,218	0.35		1.12	3.83
	7/18	6											
12	Period	12											
	7/20	6	111	1,332	490	1,722	3	19	3,934	0.37		1.29	2.95
	7/21	6											
13	Period	12											
	7/22	6	74	888	211	1,312	1	17	1,668	0.24		1.48	1.88
	7/23	6											
14	Period	12											
	7/24	6	65	780	187	907	47	1	1,280	0.24	0.06	1.16	1.64
	7/25	6											
15	Period	12											
	7/27	6	Storm										
	7/28	6											
16	Period	12											
	7/29	6	42	504	116	429	410	4	797	0.23	0.81	0.85	1.58
	7/30	6											
17	Period	12											
	7/31	6	30	360	41	97	214	12	188	0.11	0.59	0.27	0.52
	8/1	6											
18	Period	12											
	8/3	6	54	648	72	272	713	9	205	0.11	1.10	0.42	0.32
	8/4	6											
19	Period	12											
	8/5	6	50	600	59	293	934	17	297	0.09	1.55	0.49	0.46
	8/6	6											
20	Period	12											
	8/7	6	47	564	43	240	693	7	114	0.08	1.23	0.42	0.20
	8/8	6											
21	Period	12											
	8/10	6	68	816	54	77	5,430	5	60	0.07	6.65	0.09	0.07
	8/11	6											
22	Period	12											
	8/12	6	76	912	44	103	3,362	0	46	0.05	3.70	0.11	0.05
	8/13	6											
23	Period	12											
	8/14	6	78	936	29	44	3,138	0	37	0.03	3.35	0.05	0.04
	8/15	6											
24	Period	12											
	8/17	6	57	684	11	9	2,008	9	11	0.02	2.9	0.01	0.02
	8/18	6											
25	Period	12											
	8/19	6	76	912	17	10	5,019	3	7	0.02	5.5	0.01	0.01
	8/20	6											
26	Period	12											
	8/21	6	61	732	5	3	3,193	0	2	0.01	4.36		
	8/22	6											
27	Period	12											
	8/24	6	56	672	14	0	2,790	0	0	0.02	5.15		
	8/25	6											
28	Period	12											
	8/26	6	72	864	6	0	4,552	0	4	0.01	5.3		
	8/27	6											
29	Period	12											
	8/28	6	77	924	4	0	3,737	4	2		4.1		
	8/29	6											
30	Period	12											
	8/31	6	66	792	2	0	3,382	0	1		4.3		
	9/1	6											
31	Period	12											
	9/2	6	81	972	1	0	4,065	0	4		4.18		
	9/3	6											
32	Period	12											
	9/4	6	68	816	2	5	2,058	0	0		2.5	0.01	
	9/5	6											
33	Period	12											
	9/7	6	52	624	0	0	1,798	0	2		2.9		
	9/8	6											
Grand Total		372	186	25,656	24,525	17,292	47,589	160	53,316	0.95	1.3	0.57	2.08

551

Table 12. Commercial salmon catch data, Goodnews Bay (District 5, Stat. Area 335-50), all gear combined 1981.

Period Code	Date of Landing	Hours Open to Fishing	Fishermen		Catch					Catch/Fisherman Hour			
			Fishermen	Hours	King	Red	Coho	Pink	Chum	King	Coho	Red	Chum
1	6/15	6	13	156	197	70			102	1.26		0.45	0.65
	6/16	6											
2	Period	12											
	6/18	6	18	216	1,158	281			194	5.36		1.30	0.90
	6/19	6											
3	Period	12											
	6/22	6	28	336	1,591	569			708	4.74		1.69	2.11
	6/23	6											
4	Period	12											
	6/25	6	29	348	1,621	1,040			724	4.66		2.99	2.08
	6/26	6											
5	Period	12											
	6/29	6	26	312	457	1,422			425	1.46		4.56	1.36
	6/30	6											
6	Period	12											
	7/2	6	22	264	329	1,818			713	1.25		6.89	2.70
	7/3	6											
7	Period	12											
	7/6	6	25	300	272	2,346			963	0.91		7.82	3.21
	7/7	6											
8	Period	12											
	7/8	6	29	348	190	2,128			1,332	0.55		6.11	3.83
	7/9	6											
9	Period	12											
	7/10	6	28	336	199	3,217			1,601	0.59		9.57	4.76
	7/11	6											
10	Period	12											
	7/13	6	27	324	135	2,720			1,143	0.42		8.40	3.53
	7/14	6											
11	Period	12											
	7/15	6	32	768	182	4,818			2,495	0.24		6.28	3.25
	7/16	18											
12	Period	24											
	7/17	6	31	744	210	3,936			1,532	0.28		5.29	2.06
	7/18	18											
13	Period	24											
	7/20	6	31	744	145	3,852			932	0.19		5.17	1.25
	7/21	18											
14	Period	24											
	7/22	6	24	576	80	2,207			307	0.14		3.80	0.53
	7/23	18											
15	Period	24											
	7/24	6	26	624	77	2,458			244	0.12		3.94	0.39
	7/25	18											
16	Period	24											
	7/27	6	16	384	45	1,270			58	0.12		3.31	0.15
	7/28	18											
17	Period	24											
	7/29	6	12	288	31	1,193	9		32	0.11	0.03	4.14	0.11
	7/30	18											
18	Period	24											
	7/31	6	7	168	34	803	38		8	0.20	0.23	4.78	0.05
	8/1	18											
19	Period	24											
	8/3	12	23	276	56	949	66		22	0.20	0.24	3.44	0.08
20	Period	12											
	8/5	12	24	288	25	932	210		22	0.09	0.73	3.24	0.08
21	Period	12											
	8/7	12	23	276	43	686	231		21	0.16	0.84	2.49	0.08
22	Period	12											
	8/10	12	30	360	26	472	974		26	0.07	2.71	1.31	0.07
23	Period	12											
	8/12	12	33	396	26	238	2,074		16	0.07	5.42	0.60	0.04
24	Period	12											
	8/14	12	38	456	41	316	2,354		9	0.09	5.16	0.69	0.02
25	Period	12											
	8/17	12	36	432	2	238	1,390		7	-	3.22	0.55	0.02
26	Period	12											
	8/19			Closed									
27	Period	12											
	8/21	12	21	252	3	89	968	0	0	0.01	3.84	0.35	-
28	Period	12											
	8/24	12	22	264	2	48	1,597	0	0	0.01	6.05	0.18	-
29	Period	12											
	8/26	12	24	288	2	68	1,918	11	0	0.01	6.67	0.24	-
30	Period	12											
	8/28	12	27	324	1	38	1,377		0	-	4.25	0.12	-
31	Period	12											
	8/31	12	27	324	2	13	1,698	0	0	-	5.2	0.04	-
32	Period	12											
	9/2	12	24	288	2	36	1,484	0	0	0.01	5.15	0.125	-
33	Period	12											
	9/4	12	23	276	6	0	2,685	0	4	0.02	9.7	-	0.01
34	Period	12											
	9/7	12	10	120	0	2	676	0	2	-	5.6	0.02	0.02
Grand Total		492	48	11,256	7,190	40,273	19,749	11	13,642	0.64	1.75	3.6	1.2

Table 13. Aerial salmon escapement surveys in the Kuskokwim area, 1981.

	Survey Conditions	Date	Kings	Reds	Cohos	Pinks	Chums
<u>KUSKOKWIM BAY</u>							
Goodnews River System	Unable to Survey						
Kanektok River System	Poor	7/24/81	15,900	49,175		4,350	71,840
<u>KUSKOKWIM RIVER</u>							
Aniak River System	Poor	8/4/81	10,922	400		200	99,655
Kwethluk River System	Poor	7/22/81	2,034				5,496
Kisaralik River System	Poor	7/22/81	940				7,508
Gagaryah River	Poor	8/7/81	53				
Salmon River	Poor	8/5/81	1,474				

Appendix Table 1. Kuskokwim River Distances

	Distances from:			
	Mouth		Bethel	
	Kilometer	Miles	Kilometer	Miles
<u>Kuskokwim River</u>				
Kuskokwim River Mouth, 60.08°N, 162.42°W	0.0	0.0	-126.1	-78.4
Eek Island, North End, 60° 10'	27.1	17.0	- 99.0	-61.5
Eek River	35.5	22.1	-100.0	-62.1
Kwegooyuk	38.3	23.8	- 87.78	-54.5
Kinak River	47.7	29.6	- 78.4	-48.7
Tuntutuliak Village	56.8	35.3	- 87.6	-54.4
Kialik River	59.5	37.0	- 66.6	-41.4
Fowler Island	84.3	52.4	- 41.8	-26.0
Johnson River	94.1	58.4	- 32.1	-19.9
Napakiak Village	104.3	64.8	- 21.9	-13.6
Napaskiak Village	114.5	71.2	- 11.6	- 7.2
Oscarville Village	115.3	71.6	- 10.8	- 6.7
Bethel City	126.1	78.4	0.0	0.0
Gweek River	144.7	89.9	18.6	11.6
Kwethluk Village	158.9	98.7	32.8	20.4
Aktachuk Village	169.0	105.0	42.9	26.6
Kasigluk River	174.5	108.4	48.3	30.0
Kisaraalik River	175.7	109.2	49.6	30.8
Akiak Village	189.8	117.9	63.6	39.5
Mishevik Slough	197.6	122.8	71.4	44.4
Tuluksak Village	218.4	135.7	92.3	57.3
Mud Creek Slough	298.2	185.3	172.0	106.9
Lower Kalskag Village	304.7	189.3	178.6	111.0
Kalskag Village	308.7	191.8	182.6	113.5
Aniak Village, Aniak River	362.2	225.1	236.1	146.7
Chuathbaluk Village	375.4	233.3	249.3	154.9
Kolmakof River	395.8	246.0	269.7	167.6
Napaumiut Village	409.8	254.6	283.7	176.3
Holokuk River	414.6	257.6	288.5	179.3
Oskawalik River	449.0	279.0	322.9	200.6
Crooked Creek Village	467.2	290.3	341.1	211.9
Georgetown Village, George River	496.7	308.6	370.5	230.2
Red Devil Village	526.0	326.9	399.9	248.5
Sleetmute Village	538.6	334.7	412.5	256.3
Holitna River	541.2	336.3	415.1	257.9
Stony River Village	585.2	363.6	459.0	285.2
Stony River	586.9	364.7	460.8	286.3
Swift River	612.1	380.4	486.0	302.0
Tatlawiksuk River	617.1	383.4	491.0	305.1
Devil's Elbow	645.3	401.0	519.2	322.6

Appendix Table 1. Kuskokwim River Distances (continued)

	Distances from:			
	Mouth		Bethel	
	Kilometer	Miles	Kilometer	Miles
Vinassale	735.8	460	610	381
McGrath Village	811	507	685	428
Middle Fork	885	553	759	474
Big River	896.1	560	770	481
Pitka Fork	916	572	790	494
Medfra Village	922.7	577	797	499
South Fork	927	579	801	501
Nikolai Village	993.6	621	868	542
East Fork	938	586	812	508
North Fork	938	586	812	508
Swift Fork	1,129.1	706	1,003	627
Telida Village	1,178.2	736	1,052	658
Highpower Co.	1,193.1	746	1,067	667
Fish Cr.	1,277.4	798	1,151	719
North Fork Lake		829	1,201	751
Top of Kuskokwim Drainage		931	1,364	852

Appendix Table 2. Fishes commonly found in the Kuskokwim Area.

Species Code	Genus and species	Common name
162	<i>Cottus cognatus</i>	Slimy Sculpin
410	<i>Oncorhynchus tshawytscha</i>	King Salmon
420	<i>Oncorhynchus nerka</i>	Red Salmon
430	<i>Oncorhynchus kisutch</i>	Coho Salmon
440	<i>Oncorhynchus gorbuscha</i>	Pink Salmon
450	<i>Oncorhynchus keta</i>	Chum Salmon
500	<i>Esox lucius</i>	Pike
513	<i>Osmerus eperlanus</i>	Boreal Smelt
514	<i>Hypomesus olidus</i>	Pond Smelt
520	<i>Salvelinus alpinus</i>	Char
541	<i>Salmo gairdneri</i>	Rainbow Trout
550	<i>Salvelinus namaycush</i>	Lake Trout
570	<i>Stenodus leucichthys</i>	Shee
581	<i>Coregonus nasus</i>	Broad Whitefish
582	<i>Coregonus pidschian</i>	Humpback Whitefish
583	<i>Coregonus albula</i>	Least Cisco
584	<i>Coregonus autumnalis</i>	Arctic Cisco
585	<i>Prosopium cylindraceum</i>	Round Whitefish
590	<i>Lota lota</i>	Burbot, Lush
601	<i>Lampetra japonica</i>	Arctic Lamprey
610	<i>Thymallus arcticus</i>	Arctic Grayling
630	<i>Dallia pectoralis</i>	Blackfish
640	<i>Catostomus catostomus</i>	Longnose Sucker
661	<i>Pungitius pungitius</i>	9-spine Stickleback
113	<i>Eleginus gracilis</i>	Saffron Cod
121	<i>Pleuronectes stellatus</i>	Starry Flounder
122	<i>Liopsetta glacialis</i>	Arctic Flounder
166	<i>Oligocottus maculosus</i>	Sculpin
200	<i>Hippoglossus stenolepsis</i>	Pacific Halibut
230	<i>Clupea pallasii</i>	Pacific Herring
516	<i>Mallotus villosus</i>	Capelin

Appendix Table 3. Kuskokwim area commercial and subsistence salmon catches, 1913-1981.

Year	Commercial Catch						Subsistence Catch 1/		
	King	Red	Coho	Pink	Chum	Total	King	Other Salmon 2/	Total
1913	7,800					7,800			
1914		2,667				2,667			
1915									
1916	949					949			
1917	7,878					7,878			
1918	3,055					3,055			
1919	4,836					4,836			
1920	34,853					34,853			
1921	9,854					9,854			
1922	8,944	6,120				15,064			180,000
1923	7,254					7,254			
1924	19,253	900	7,167		7,167	34,487	14,700	203,148	217,848
1925	1,664	5,800				7,514	10,800	230,850	241,650
1926								738,576	738,576
1927								286,254	286,254
1928								481,090	481,090
1929								560,196	560,196
1930	7,626	2,448				9,963		538,650	538,650
1931	8,541					8,541		389,367	389,367
1932	9,339					9,339		746,415	746,415
1933							6,290	433,998	440,288
1934							20,800	597,132	617,932
1935	6,448		8,296			14,744	22,930	554,040	576,970
1936	624					624	33,500	549,423	582,923
1937	480					480		537,111	537,111
1938	624		828			1,452	10,153	400,242	410,395
1939	134					134	14,000	125,425	139,425
1940	247		500			747	8,000	415,523	423,523
1941	187		674			861	8,000	415,523	423,523
1942							6,400	325,339	331,739
1943							6,400	325,800	332,200
1946	2,288		674			2,962			
1947	5,356					5,356			
1951	4,210					4,210			
1954	57					57			
1959	3,760					3,760			
1960	5,969	5,649	5,498		3	17,119	20,361	327,297	347,658
1961	23,246	2,308	5,090	91	18,864	49,599	30,910	185,447	216,357
1962	20,867	10,313	12,598	4,340	45,707	93,831	14,642	165,626	180,268
1963	18,571		15,660			34,231	37,246	141,550	178,796
1964	21,230	13,422	28,992	939	707	65,290	30,853	214,942	245,795
1965	24,965	1,886	12,191		4,242	43,284	31,143	323,002	354,145
1966	25,823	1,030	22,985	268	2,610	52,716	53,606	201,002	254,608
1967	29,986	652	58,239		8,235	97,112	61,224	252,447	313,671
1968	43,157	5,884	154,302	75,818	19,694	298,845	34,986	301,531	336,517
1969	64,777	10,362	110,473	1,251	50,377	237,240	43,732	245,299	289,031

Appendix Table 3. Kuskokwim area commercial and subsistence salmon catches, 1913-1981 (continued)

Year	Commercial Catch						Subsistence Catch 1/		
	King	Red	Coho	Pink	Chum	Total	King	Other Salmon 2/	Total
1970	65,082	12,654	62,245	27,422	60,566	227,979	71,376	263,746	335,112
1971	44,936	6,054	10,006	13	99,423	160,432	45,465	130,329	175,794
1972	55,482	4,312	23,880	1,952	97,197	182,823	43,335	131,514	184,849
1973	51,374	5,224	152,408	634	184,207	393,847	41,697	211,468	253,165
1974	30,670	29,003	179,579	60,052	196,127	495,431	29,590	321,358	350,848
1975 3/	27,799	17,535	109,814	899	223,532	379,579	51,045	180,429	231,474
1976	49,262	14,636	112,130	39,998	231,877	447,903	60,603	239,461	300,064
1977	58,256	18,621	263,728	434	298,959	639,998	58,163	218,824	276,987
1978	63,194	13,734	247,271	61,968	282,044	668,211	38,209 4/	137,489 4/	175,698
1979	53,314	39,463	308,683	574	297,167	699,201	57,283	190,582	247,865
1980	48,242	42,213	327,908	30,306	561,483	1,010,152	59,900	105,000	224,900
1981	79,378	105,940	278,587	463	485,635	950,003	63,640	187,932	251,572
Previous 5 year average	54,454	25,833	251,944	26,749	334,306	693,093	54,832	178,271	245,103

- 1/ Subsistence catches for 1960-1976 have been revised and corrected.
 2/ Primarily chum salmon and coho salmon.
 3/ Final catch data used.
 4/ Goodnews Bay not surveyed.

Appendix Table 4. Kuskokwim Area, Commercial Effort by District, 1970-1981 1/

<u>District 1</u>				
Year	King Season	Chum Season	Coho Season	Total
1970	361	2/	266	387
1971	418	216	83	422
1972	405	176	245	425
1973	456	341	411	530
1974	606	467	516	666
1975	472	540	533	737
1976	561	517	516	674
1977	563	522	572	653
1978	615	617	597	723
1979	591	617	613	685
1980	553	579	586	663
1981	529	613	586	679
Previous 5 year ave.	576	570	576	680

<u>District 2</u>				
Year	King Season	Chum Season	Coho Season	Total
1970	10	2/	11	18
1971	22	2/	2/	22
1972	12	2/	2/	12
1973	28	2/	2/	28
1974	36	2/	16	37
1975	38	2/	2/	38
1976	55	2/	11	57
1977	83	54	24	105
1978	28	2/	16	43
1979	41	2/	20	43
1980	37	21	12	43
1981	153	11	16	153
Previous 5 year ave.	49	15	17	58

<u>District 4</u>		<u>District 5</u>	
Year	Total	Year	Total
1970	88	1970	35
1971	61	1971	16
1972	107	1972	14
1973	109	1973	21
1974	196	1974	49
1975	127	1975	50
1976	181	1976	40
1977	258	1977	34
1978	200	1978	35
1979	206	1979	30
1980	169	1980	48
1981	186	1981	48
Previous 5 1932 year ave.	203	Previous 5 1926 year ave.	38

1/ Number of actual fishing vessels.

2/ No commercial fishing allowed.

Appendix Table 5. Kuskokwim area commercial catches by drainage, 1960-1981.

Kuskokwim River (1)	King	Red	Coho	Pink	Chum	Total
1960	5,969	0	2,498	0		8,467
1961	18,918	0	5,044	0		23,962
1962	15,341	0	12,432	0		27,773
1963	12,016	0	15,660	0		27,676
1964	17,149	0	28,613	0		45,762
1965	21,989	0	12,191	0		34,180
1966	25,545	0	22,985	0		48,530
1967	29,986	0	56,313	0	148	86,447
1968	34,278	0	127,306	0	187	161,771
1969	43,997	322	83,765	0	7,165	135,249
1970	39,290	117	38,601	44	1,664	79,716
1971	40,274	2,606	5,253	0	68,914	117,047
1972	39,454	102	22,579	8	78,619	140,762
1973	32,838	369	130,876	33	148,746	312,862
1974	18,664	136	147,269	37	171,887	337,984
1975	21,720	23	81,945	10	181,840	285,538
1976 (4) Deleted	30,735	2,971	88,501	133	177,864	300,204
1977	35,830	9,379	241,364	203	248,721	535,451
1978	45,641	733	213,393	5,832	248,656	514,255
1979	38,966	1,054	219,060	78	261,874	521,032
1980	35,881	360	222,012	803	483,211	742,297
1981	47,663	48,375	211,251	292	418,677	726,258
Previous 5 year average	37,411	2,900	200,472	1,410	284,065	522,648

Appendix Table 5. Kuskokwim area commercial catches by drainage, 1960-1981 (Continued).

(Kanehtok River 2/	King	Red	Coho	Pink	Chum	Total
1960	0	5,649	3,000	0	0	8,649
1961	4,328	2,308	46	90	18,854	25,636
1962	5,526	10,313	0	4,340	45,707	65,886
1963	6,555	0	0	0	0	6,555
1964	4,081	13,422	379	939	707	19,528
1965	2,976	1,886	0	0	4,242	9,104
1966	278	1,030	0	268	2,610	4,186
1967	0	652	1,926	0	8,087	10,665
1968	8,879	5,884	21,511	75,818	19,497	131,589
1969	16,802	3,784	15,077	953	38,206	74,822
1970	18,629	5,393	16,850	15,195	46,556	102,623
1971	4,185	3,118	2,982	13	30,208	40,506
1972	15,880	3,286	376	1,878	17,247	38,667
1973	14,993	2,783	16,515	277	19,680	54,248
1974	8,704	19,510	10,979	43,642	15,298	98,133
1975	3,928	8,584	10,742	486	35,233	58,973
1976 (4/ Deleted	14,110	6,090	13,777	31,412	43,659	109,048
1977	19,090	5,519	9,028	202	43,707	77,546
1978	12,335	7,589	20,114	47,033	24,798	111,869
1979	11,144	18,828	47,525	295	25,995	103,787
1980	10,387	13,221	62,610	21,671	65,984	173,873
1981	24,525	17,292	47,587	160	53,316	143,080
Previous 5 year average	13,413	10,250	30,611	20,123	40,829	115,225

Appendix Table 5. Kuskokwim Area commercial catches by drainage, 1960-1981 (Continued).

Goodnews Bay(Goodnews River ^{3/})	King	Red	Coho	Pink	Chum	Total
1968			5,485			5,485
1969	3,978	6,256	11,631	298	5,006	27,169
1970	7,163	7,144	6,974	12,183	12,346	45,630
1971	477	330	1,771	0	301	2,879
1972	264	924	925	66	1,331	3,510
1973	3,543	2,072	5,017	324	15,781	26,737
1974	3,302	9,357	21,340	16,373	8,942	59,314
1975	2,151	8,928	17,127	403	6,459	35,068
1976 ^{4/} 2	4,417	5,575	9,852	8,453	10,354	38,651
1977	3,336	3,723	13,335	29	6,531	26,954
1978	5,218	5,412	13,764	9,103	8,590	42,087
1979	3,204	19,581	42,098	201	9,298	74,382
1980	1,974	28,632	43,256	7,832	11,748	93,442
1981	7,190	40,273	19,749	11	13,642	80,865
Previous 5 year average	3,630	13,585	24,461	5,124	9,192	54,993

^{1/} Includes districts 335-10, 335-20 and 335-30. Commercial fishing in 335-30 has been prohibited since 1966.

^{2/} Subdistrict 335-40.

^{3/} Subdistrict 335-50 and includes Chagvan Bay.

^{4/} Final catch data used.

DeLore

Appendix Table 6. Kuskokwim area commercial king salmon catches, by district, 1960-81

Total catch							
Year	335-10 ^{1/}	335-20 ^{1/}	335-30	335-40	335-50	335-60	Total
1960	2,927	1,231	1,811	0			5,969
1961	15,820	1,551	1,547	4,328			23,246
1962	13,306	2,035	0	5,526			20,867
1963	9,095	2,921	0	6,555			18,571
1964	15,754	1,395	0	4,081			21,230
1965	21,452	537	0	2,976			24,965
1966	25,212	333	0	278			25,823
1967	29,367	615		0			29,986
1968	33,451	826		8,879	0		43,157
1969	43,141	853		16,802	3,978	7	64,777
1970	37,775	1,463		18,629	7,163		65,082
1971	35,421	2,439		4,185	477		44,936
1972	37,699	1,755		15,880	264		55,482
1973	28,194	2,244		14,993	3,543		51,374
1974	16,031	951		8,704	3,302		30,670
1975	18,235	1,319		3,928	2,151		27,799
1976	29,010	3,316		14,110	4,417		49,262
1977	28,685	3,975		19,090	3,336		55,086
1978	36,139	2,087		12,335	5,218		55,779
1979	24,633	2,913		11,144	3,204		41,894
1980	26,812	1,697		10,387	1,974		40,655
1981	29,882	4,771		24,524	7,190		66,367

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Dist. King
Only

Previous
5 year

average 27,256	2,798	13,413	3,630	48,535
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Appendix Table 7. Commercial salmon pack by species in round weight (lbs.), Kuskokwim area, 1968-1981 1/.

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Fresh or frozen										
King	794,682	1,032,863	1,113,890	801,628	1,400,243	1,371,685	566,941	159,845	935,652	1,326,773
Red	36,480	25,351	68,116	30,635	4,319	37,816	179,768	108,216	95,761	154,706
Coho	1,090,690	322,254	453,125	64,457	152,832	883,966	1,245,132	670,598	809,916	2,009,171
Pink	303,270	3,413	90,703		6,442	2,092	246,134	2,809	133,911	1,678
Chum	146,230	249,007	367,715	678,173	631,781	1,252,607	1,220,496	1,350,936	1,609,718	2,185,549
Salmon roe,										
(lbs. of finished product)	2/	56,926	42,958	64,136	62,963	165,574	2/	43,113	120,405 3/	109,105 3/
	1978	1979	1980	1981						
Fresh or frozen										
King	1,530,461	999,043	617,137	1,462,593						
Red	89,489	320,541	290,251	761,848						
Coho	1,758,213	2,418,136	2,234,781	1,862,836						
Pink	241,523	2,290	107,719	1,628						
Chum	2,508,123	2,059,686	3,471,378	3,538,440						
Salmon roe,	142,496 3/		110,806	26,321						
(lbs. of finished product)										

1/ Pack represents type of processing when fish were shipped out of district.

2/ Information not available.

3/ Raw product.

Appendix Table 8. Mean salmon weights and prices paid to fishermen,
Kuskokwim (area), 1964-1981.

Year	King	Mean weights-lbs.			Chum
		Coho	Red	Pink	
1964	23.2	6.5	5.8		6.1
1965	21.7	6.5	6.6		
1966	23.2	6.7			
1967	27.8	5.9	7.4		7.0
1968	23.8	7.2	6.2	4.0	7.9
1969	19.6	7.3	6.2	3.6	5.8
1970	18.9	7.3	5.4	3.3	6.1
1971	26.2	6.1	6.9	2/	6.4
1972	24.7	6.4	2/	2/	6.5
1973	26.7	5.8	2/	2/	6.8
1974	17.1	7.5	6.3	4.1	6.8
1975	14.9	8.2	2/	2/	6.4
1976	17.0	7.8	6.7	3.5	7.0
1977	22.7	7.8	8.3	3.9	7.3
1978	24.2	7.1	6.5	3.9	8.9
1979	16.6	7.9	6.9	3.9	7.0
1980	14.1	6.9	6.7	3.6	6.4
1981	17.8	6.4	7.2	3.5	7.5

Year	King	Mean prices per fish (mean price per pound)			Chum
		Coho	Red	Pink	
1964	\$3.25 (0.14)	\$.35 (0.05)	\$.50 (0.09)	\$	\$
1965 ^{1/}					
1966	3.00 (0.13)	.40 (0.06)	.50	.10	.10
1967	3.55 (0.13)	.52 (0.09)	.40 (0.05)		.25 (0.04)
1968	3.74 (0.16)	.67 (0.09)	.60 (0.10)	.20 (0.05)	.35 (0.04)
1969	3.80 (0.19)	.76 (0.10)	.91 (0.15)	.22 (0.06)	.43 (0.07)
1970	3.78 (0.20)	1.03 (0.14)	1.15 (0.21)	.26 (0.08)	.51 (0.08)
1971 ^{3/}	4.53 (0.17)	.82 (0.13)	.71 (0.10)	2/	.50 (0.08)
1972	4.93 (0.20)	1.00 (0.16)	.88	.25	.54 (0.08)
1973	6.83 (0.25)	1.50 (0.26)	2.32	.53	1.28 (0.19)
1974	7.96 (0.46)	2.00 (0.27)	2.15 (0.34)	.93 (0.23)	1.71 (0.25)
1975	8.05 (0.54)	2.54 (0.31)	2/	2/	1.67 (0.26)
1976	10.82 (0.64)	3.12 4/ (0.40)	2.85 (0.43)	.88 (0.25)	1.89 (0.27)
1977	26.11 (1.15)	5.07 (0.65)	3.74 (0.45)	.98 (0.25)	3.29 (0.45)
1978	12.09 (0.50)	2.85 (0.40)	3.18 (0.49)	.48 (0.12)	2.83 (0.32)
1979	10.96 (0.66)	5.93 (0.75)	3.66 (0.53)	.43 (0.11)	2.59 (0.37)
1980	6.70 (0.47)	4.43 (0.64)	2.08 (0.31)	.45 (0.12)	1.51 (0.24)
1981	15.40 (0.87)	4.06 (0.63)	4.36 (0.61)	.40 (0.11)	1.69 (0.23)

^{1/} Samples available only for two periods - 7/1-2 - 7/5-6.

^{2/} Information unavailable.

^{3/} Information not available for 335-50 (Goodnews) only fished one day.

^{4/} Information not available for 335-40 (Quinhagak).

Appendix Table 9. Dollar value estimates of Kuskokwim Area Commercial Fishery, 1964-1981. 1/

Year	Gross Value of catch to fishermen	Wages earned 2/	Total income to district	Wholesale value of pack 3/	Tax revenue to state
1964	\$ 83,030.00	\$	\$	\$ 409,700.00	\$ 6,100.00
1965	90,950.00			370,000.00	8,200.00
1966	87,466.00			406,500.00	8,100.00
1967	130,647.00	20,000.00	158,647.00	727,000.00	
1968	290,370.00	40,000.00+	330,370.00+	1,135,000.00	17,000.00
1969	297,233.00	60,435.00+	357,668.00		
1970	362,470.00	127,327.00	489,797.00	1,300,000.00	20,000.00
1971	371,220.00	80,510.00	451,730.00	672,180.00	16,770.00
1972	360,727.00	85,895.00	447,622.00		
1973	827,735.00	150,000.00+	977,735.00	3,600,000.00	32,000.00
1974	1,056,042.00	150,000.00+	1,206,042.00		
1975	899,178.00	165,000.00+		2,000,000.00	25,000.00
1976	1,380,229.00	175,000.00+	1,555,229.00		
1977	3,891,950.00	200,000.00+	4,091,950.00		
1978	2,337,470.00	250,000.00+	2,587,470.00		
1979	3,678,000.00	275,000.00+	3,953,000.00+		
1980	2,725,134.00	300,000.00	3,025,134.00		
1981	3,766,525.00	325,000.00	4,091,525.00		

1/ Information not available for wages earned during 1964-1966.

2/ Includes wages paid to tenderboat operators, processing plant employees in district.

3/ Based on type of processing when fish were shipped out of the district.

Appendix Table 10. Utilization of Kuskokwim River king salmon, 1960-1981.

Year	Commercial Catch 1/	Subsistence Catch 2/	Total Utilization
1960	5,969	20,361	26,330
1961	18,918	30,910	49,828
1962	15,341	14,642	29,983
1963	12,016	37,246	49,262
1964	17,149	29,017	46,166
1965	21,989	27,143	49,132
1966	25,545	49,606	75,151
1967	29,986	57,875	87,861
1968	34,278	30,230	64,508
1969	43,997	40,138	84,135
1970	39,290	69,204	108,494
1971	40,274	42,926	83,200
1972	39,454	40,145	79,599
1973	32,838	38,526	71,365
1974	18,664	26,665	45,329
1975	21,720	47,784	69,504
1976	30,735	58,185	88,920
1977	35,830	55,577	91,407
1978	45,641	35,881	81,522
1979	38,966	55,524	94,490
1980	35,881	59,900	95,781
1981	47,663	59,669	107,332
Previous 5 average	37,411	53,013	90,424

1/ Districts 335-10, 335-20 and 335-30 to the Swift River

2/ Catches are expanded and include all villages surveyed each year.
Data includes a few villages and not included in comparative catch tables.

Appendix Table 11. Comparative king salmon catches by fishing period during the king salmon season, Kuskokwim River (District 1, 335-10), 1974-1981.

Year	Date	Catch	Fishermen		C.F.H.
			Fishermen	Hours	
1974	June 10-11	4,384	422	5,064	0.9
	June 13-14	5,790	488	5,856	1.0
	June 17-18	5,857	506	6,072	1.0
	Totals	16,031	606	16,992	0.9
1975	June 16	359	12	72	5.0
	June 19-20	1,031	46	552	1.9
	June 23-24	17,235	483	5,796	2.9
	Totals	18,625	541	6,420	2.9
1976	June 17	6,962	459	2,754	2.5
	June 21	13,048	495	2,970	4.4
	Totals	20,010	561	5,724	3.5
1977	June 15	12,458	467	2,802	4.5
	June 20	16,227	484	2,904	5.6
	Totals	28,685	563	5,706	5.0
1978	June 9	7,590	509	3,054	2.5
	June 14	6,142	266	1,596	3.9
	June 16	12,341	396	2,376	5.2
	June 22	1,724	72	288	6.0
	June 23	8,342	429	1,716	4.9
	Totals	36,139	615	9,030	4.0
1979	June 11	12,270	523	3,138	3.9
	June 15	12,363	549	3,294	3.8
	Totals	24,633	591	6,432	3.8
1980	June 12	9,891	469	2,814	3.5
	June 18	16,921	468	2,808	6.0
	Totals	26,812	553	5,622	4.8
1981	June 10	11,897	489	2,934	4.1
	June 16	17,985	541	3,246	5.5
	Totals	29,882	589	6,180	4.8

Appendix Table 12. Associated Environmental and Catch Data, Kuskokwim River, 1965-1981.

Year	Breakup at Bethel	River Clear of Ice	First Reported King Salmon	First Reported Smelt	Freezeup at Bethel
1965	1/	1/	May 31	May 25	1/
1966	June 1	1/	June 1 (Kalskag)	June 6	Oct. 20
1967	May 6	May 17	May 20	May 25	Oct. 19
1968	May 14	May 17	May 26	1/	1/
1969	May 6	May 13	May 23	1/	1/
1970	May 12	May 16	May 21	May 27	Oct. 18
1971	May 24	May 29	June 6	June 7	Nov. 4
1972	May 23	May 28	June 5	June 6	Nov. 3
1973	May 14	May 18	May 27	May 31	Oct. 15
1974	May 7	May 19	May 23	May 25	1/
1975	May 19	May 25	May 26	May 29	Oct. 29
1976	May 18	May 28	June 1	1/	Oct. 27
1977	May 23	June 1	May 31	June 2	Oct. 18
1978	1/	1/	May 18	May 22	Oct. 25
1979	Apr. 27	May 7	May 16	1/	Nov. 19
1980	May 4	May 10	May 17	May 22	1/
1981	May 9	May 12	May 22	May 6	Nov. -

1/ Data not available